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cause of this equatorial wind-belt is probably the lagging-back of the loosely cohering and adhering atmosphere over the equatorial region, which has a maximum motion of rotation from west to east of about a thousand miles an hour. The equatorial wind-current has a motion westward of from five to ten miles an hour, but this is only relative to the surface of the earth, since it has an absolute movement eastward with the earth of perhaps 990 to 995 miles an hour.

The lagging-back of the atmosphere over the tropical regions may be altogether due to its inertia, or it may be in part the effect of friction with that real but intangible medium which fills the interstellar spaces, — the luminiferous ether. Whatever the cause of the equatorial wind-current may be, its importance in the physics of the globe cannot be exaggerated. Among the other phenomena with which it may be credited are the red sunsets which are now generally believed — as stated by the editor of your astronomical column — to be due to the projection into this equatorial current of an immense volume of volcanic dust from Krakatoa, which has not only floated many times around the earth, but has been widely diffused north and south of the equator by the high upper currents of air that flow from the equator toward the poles, and constitute the other great factors in atmospheric circulation. Along the thermal equator the heated air is constantly rising, and is replaced by the cooler and denser air flowing along the surface from the north and south. This, coming from regions where the rotation of the earth is much less than at the equator, reaches the torrid zone with a strong relative motion toward the west, — going slower than the earth, — and giving us the south-east trades of the southern side of the equator, and the north-east of the northern. The constant upward tendency of the air along the heated zone would retard the descent of the dust, and favor its suspension in the heaped-up mass of air which flows northward and southward from the equator. This air, which has an absolute eastward movement with the earth of perhaps 990 miles per hour, soon reaches a zone where the earth's movement is less than this, and where, with reference to the surface, the movement is toward the north-east in the northern hemisphere, and south-east in the southern. This, as is known to many, but perhaps not to all, of your readers, gives us the general drift of the atmosphere over the United States.

By the northward and southward flow of the tropical and dust-bearing air, that dust may be diffused over most of the earth's surface before it settles.

J. S. NEWBERRY.

New York, Dec. 28.

Congenital deaf-mutism.

The chief requisite to racial experiments is isolation. A race of men is a breed, a stock, a strain that has been isolated long enough to fix by inheritance a number of characteri tics. This isolation may be either geographical or social. Where caste prevails and marriage is confined to groups, the characteristics of each group will be fixed and perpetuated. This is social isolation, and the result is in the nature of a race. At the time when there were fewer people on the earth, and when the allurements to commerce and the means of locomotion were not so numerous, the present races of the world were fixed.

Prof. A. Graham Bell has on several occasions lately called attention to the formation of a race of deaf-mutes by caste isolation and intermarriage. A very interesting example of reaching a race of deaf-mutes by geographical isolation has just come to my notice.

Lieut. H. T. Allen, U.S.A., lately engaged in the exploration of Alaska, writes me as follows: —

"On two tributaries of the Koukuk River, Konootenah and Nohoolchintnah, both emptying from the south, and about seventy-five miles between mouths, were two villages about twenty-five miles from the respective confluences, the upper village 66°.40′ north, 150°.50′ west. One village contained six males, the other five; and, of these eleven, four were deaf-mutes. There was a woman who could speak fairly intelligently to her people, but could not hear. There was also a boy who was a deaf-mute. The natives said that the mutes had never been able to speak or hear, and the sounds emitted had nothing in common with the articulations of their relatives. I can account for the foregoing facts only by continued intermarriage, which is necessitated by their isolation. Above the upper village there are no tribes on the Koukuk River, none between the Nohoolchintnah and Konootenah, and none for many miles below the latter river. The men from these villages trade at the station on the Yukon River, near the mouth of the Tananáh. They claim to be Kleekots, but can readily converse with the natives of the Yukon from St. Yukon to Nulato."

O. T. MASON.

The English sparrow.

Two years ago I published the fact in the *American naturalist* (September, 1883, p. 925), of the English sparrow having practically driven all the native birds out of the beautiful parks of New Orleans, when, even so long ago as that, this bird was to be found there in numbers. I distinctly recollect having seen them in Cheyenne, Wyoming, in 1877; so that I think this pest has spread more rapidly than some of the correspondents of *Science* are perhaps aware. Of course, the most important point at issue now, is to devise means for so reducing their numbers as to render them harmless in the future, or better still, if possible, to exterminate them entirely.

The methods suggested by Mr. Ralph S. Tarr (*Science*, No. 149) are excellent so far as they go; but I would suggest a far more efficient weapon than the shot-gun, for use in the city parks, recommended by him. I refer to the collecting cane now in use by many ornithologists in this country, with the seven-chambered pistol attachment. I have an excellent one by me now, belonging to the Smithsonian institution, and I will guarantee that I could kill 350 English sparrows with it in one day in New York City, and keep it up for every day in the year, or until their decreasing numbers reduced the average. It possesses several highly important recommendations over the shot-gun: it makes scarcely any noise; the ammunition is cheap; no danger is run of injuring persons in a crowded city; and it would attract far less attention. This weapon might be placed in the hands of those who proved themselves experts in its use, or any city police force. Other persons might also be licensed to use it, who were willing to practise exterminating the birds for a reward.

R. W. SHUFELDT.

Fort Wingate, N. Mex., Dec. 18.